

REMARKS

Claims 2-4, 6, 9, 10, 19 and 21-25 are in the application. The claims had previously been rejected over various combinations of Sengupta, Fitch, Teng, Kawakubo and Stokes. The claims are amended to fully distinguish the invention over the art of record.

At the outset, it is urged that the claimed invention is not the broad concept of using planarizing techniques to provide two adjoining layers with the same height. Rather, for an example embodiment of the invention, applicants have recognized that, in a thin film acoustic device, the placement of a planarizing layer of material adjacent the base electrode, i.e., a layer of equal or comparable height to the base electrode, can impart more mechanical integrity than films of the prior art. Specifically, as discussed at page 2 of the Specification, introduction of a planarizing layer reduces the substrate topology created by the electrode to the extent that cracks do not form in the piezoelectric film or the underlying membrane.

None of the art of record teaches or suggests the corresponding features set forth in the claimed methods for forming a thin film device or in the structure of the piezoelectric device of claim 25. It is only the applicants who recognize the above-noted solution to prevent formation of cracks and it is only the applicants who provide the motivation to provide a thin film acoustic device according to the claims. The prior art of record does not contain any teaching or suggestion to form a thin film acoustic device or a piezoelectric device according to the claimed methods. In fact, none of the art of record relates to thin film acoustic devices having, for example, a piezoelectric layer formed between a pair of electrodes. Thus none of the prior art relates to the methods or structures covered by the claims.

Independent claim 19 (Amended) is now expressly directed to formation of a thin film acoustic device wherein:

"a piezoelectric film [is formed] between the base electrode and the second electrode to enable application of an electric field to the piezoelectric film ... "

A feature of this claimed method is that a portion of the second layer of material is

"positioned along the edge region of the base electrode ... having a height relative to the substrate so as to eliminate or substantially reduce a step along the base electrode edge region ..."

Applicant's method of forming a thin film acoustic device according to claim 19 is a unique and non-obvious combination. None of the art of record suggests such a combination of steps to form a thin film acoustic device.

Amended claim 22 now requires that the piezoelectric layer be positioned:

"between the base electrode and the second electrode to enable application of an electric field to the piezoelectric film."

In addition, claim 22 requires:

"planarizing the non-conducting layer so that the non-conducting layer and patterned base electrode form a continuous layer having a level surface ..."

It is submitted that the combination of features presented in claim 22 renders applicant's method of forming a thin film acoustic device distinct and non-obvious. None of the art of record teaches or suggests such a method of forming a thin film acoustic device.

The piezoelectric device of claim 25 includes a second layer of material having:

"a portion positioned along the edge region of the base electrode ... so as to eliminate or substantially reduce a step along the base electrode edge region ..."

and

"a piezoelectric film positioned between the base electrode and the second electrode ..."

The above-quoted features of claims 19, 22 and 25, in combination with other features recited in the respective claims fully distinguish the invention over the art of record. None of the art of record teaches or suggests the claimed combinations.

It is respectfully submitted that all of the claims include subject matter that is novel and non-obvious, and that each of the claims is now in condition for allowance. Allowance is requested.

Respectfully submitted,


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CERTIFICATE OF MAILING

I HEREBY CERTIFY that this Response To Office Action is being mailed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 14th day of June, 2006.

A handwritten signature in black ink that reads "Shirley Goff". Below the signature, the name "Shirley Goff" is printed in a smaller, sans-serif font.